

CLAIMS

1. An inflator for a vehicle occupant protection system comprising:
an inflator body having first and second ends;
a first elongate chamber formed in said body;
a second elongate chamber formed in said body, said second chamber fluidly connected with said first chamber proximate said first end at a first connection;
a third elongate chamber formed in said body, said third chamber fluidly connected with said second chamber proximate said second end at a second connection;
a plurality of apertures spaced longitudinally along said inflator and fluidly communicating with said third elongate chamber;
wherein said first, second and third chambers provide a substantially continuous fluid flow path through said inflator body, whereby a direction of said flow path is substantially reversed at least at each of said first and second connections.
2. The inflator of claim 1 comprising a fourth elongate chamber formed in said body, said fourth chamber fluidly connected with said third chamber proximate said first end at a third connection.
3. The inflator of claim 1 wherein said first chamber comprises a main chamber and a sub-chamber separated from said main chamber with a frangible member.
4. The inflator of claim 3 comprising an initiator assembly mounted at an end of said sub-chamber and adapted to ignite a propellant charge positioned therein.
5. The inflator of claim 2 wherein said first, second and third connections comprise bores formed in said inflator body and positioned in a radially overlapping fashion with the respective chambers fluidly connected by each said connection.
6. The inflator of claim 5 comprising a sealing plate extending across said first chamber, and said first and third connections.

7. The inflator of claim 6 comprising a sealing plate extending across said second chamber, said second connection, and said third and fourth chambers.
8. The inflator of claim 1 wherein said first, second and third chambers are substantially parallel.
9. The inflator of claim 1 wherein said inflator body comprises a substantially rectangular body having two parallel long edges and two substantially parallel short edges oriented perpendicular said long edges, wherein said flow path is oriented substantially parallel said long edges.
10. An inflator for an inflatable restraint system in a vehicle comprising:
 - an inflator body;
 - a first elongate chamber formed in said inflator body;
 - a second elongate chamber formed in said inflator body;
 - a third elongate chamber formed in said inflator body;
 - a first bore overlapping radii of said first and second elongate chambers;
 - a second bore overlapping radii of said second and third elongate chambers;
 - a plurality of gas exit orifices in fluid communication with said third elongate chamber for supplying an inflation gas to an inflatable restraint device.
11. The inflator of claim 10 comprising a first cover plate attached to said inflator body, said cover plate extending over ends of said first elongate chamber and said first bore.
12. The inflator of claim 11 comprising a fourth elongate chamber formed in said inflator body and a third bore overlapping radii of said third elongate chamber and said fourth elongate chamber.

13. The inflator of claim 11 comprising a second cover plate attached to said inflator body, said second cover plate extending over ends of said second elongate chamber and said second bore.

14. The inflator of claim 13 comprising a fourth elongate chamber formed in said inflator body, said second cover plate extending over an end of said fourth elongate chamber.

15. A method of manufacturing an inflator for an inflatable occupant restraint system in a motor vehicle comprising the steps of:

forming a first elongate chamber in an inflator body, the first elongate chamber oriented substantially parallel with a longitudinal axis thereof;

forming a second elongate chamber in the inflator body, the second elongate chamber oriented substantially parallel with the longitudinal axis;

forming a third elongate chamber in the inflator body, the third elongate chamber oriented substantially parallel with the longitudinal axis;

forming a first bore in a first end of the inflator body, wherein the bore overlaps radii of the first and second elongate chambers and fluidly connects the same;

forming a second bore in a second end of the inflator body, wherein the second bore overlaps radii of the second and third elongate chambers and fluidly connects the same.

16. The method of claim 15 comprising the steps of:

forming a fourth elongate chamber in the inflator body that is oriented substantially parallel with the longitudinal axis; and

forming a third bore in the first end of the inflator body, wherein the third bore overlaps radii of the third and fourth elongate chambers and fluidly connects the same.

17. The method of claim 16 wherein the steps of forming the second, third and fourth elongate chambers comprise forming the chambers from one end of the inflator body.

18. The method of claim 17 wherein:

the step of forming the first elongate chamber comprises forming the chamber completely through the inflator body such that it opens at first and second ends thereof;

the steps of forming the first and third bores comprise forming the first and third bores from the first end of the inflator body;

the steps of forming the second, third and fourth elongate chambers comprise forming the chambers from the second end of the inflator body; and

the step of forming the second bore comprises forming the second bore from the first end of the inflator body.

19. An inflator manufactured according to the method of claim 16.

20. An inflator manufactured according to the method of claim 18.

21. An inflator for a vehicle occupant restraint system comprising:

an inflator body;

a first elongate chamber formed in said inflator body;

a second elongate chamber formed in said inflator body;

a first bore overlapping radii of said first and second elongate chambers, providing for fluid communication therebetween;

a plurality of gas exit orifices in fluid communication with said second elongate chamber for supplying an inflation gas to an inflatable restraint device.

22. An inflator according to claim 21 positioned in an airbag module.

23. An inflator according to claim 21 positioned in a vehicle occupant protection system.

24. A gas generator for a vehicle occupant protection system comprising:
 - a housing;
 - a plurality of chambers formed within said housing, wherein each of said chambers fluidly communicates with at least one other chamber, whereby the chambers are formed to establish opposing fluid flow in each adjacent chamber upon gas generator activation.
25. The gas generator of claim 24 comprising three substantially parallel chambers extending in said housing.
26. The gas generator of claim 25 comprising four substantially parallel chambers extending in said housing.